

Notice of some Shells dredged by Capt. St. John, R.N., in Korea Strait. By J. GWYN JEFFREYS, LL.D., F.R.S., F.L.S.

[Read June 20, 1878.]

OUR knowledge of the Invertebrata inhabiting the North-Pacific Ocean has been considerably advanced by Capt. St. John's dredgings in the Japanese and Korean Seas, as the publications of this Society will testify.

With respect to the Mollusca, I noticed in the 'Journal' (Zoology, vol. xii. 1874) certain species thus procured by that excellent naturalist in North Japan, which are identical with or varieties of European species; and Mr. Edgar Smith subsequently gave, in the 'Annals and Magazine of Natural History' (ser. 4, vols. xv. and xvi. 1875), a list of Gastropoda from the same source. Capt. St. John's last dredgings in the Strait of Korea have yielded a not less abundant and valuable harvest of Mollusca; and although I prefer having the species worked out by Mr. Edgar Smith, which he will doubtless do with his usual accuracy, I cannot refrain from adding some remarks on a few of these species, which I consider European or interesting in other points of view.

In my former paper on the same subject I ventured to express an opinion that certain species of Mollusca which are common to the North-Atlantic and North-Pacific oceans might have originated in high northern latitudes, and have found their way to Japan on the one side, and Europe on the other, by means of a bifurcation of the great Arctic current. This opinion has been now corroborated by Capt. St. John, who says, in his letter to me of the 8th June, 1878, "It seems to me that the Arctic current bifurcates, bringing similar species of Mollusca, and gradually depositing them along its course in the Pacific and Atlantic."

I have to return my thanks not only to Capt. St. John for so kindly placing these further dredgings at my disposal, but to Mr. J. T. Marshall, for having laboriously and carefully sifted the smaller material and picked out and assorted all the organisms from it.

BRACHIOPODA.

TEREBRATULA CAPUT-SERPENTIS, *Linné*, var. *SEPTENTRIONALIS*.

Anomia caput-serpentis, *L. Syst. Nat.* ed. xii. p. 1153.

Terebratula caput-serpentis, *Jeffreys, British Conchology*, ii. p. 14, pl. i. f. 1; v. p. 164, pl. xix. f. 2.

Hab. Korea, 35 fathoms. Spitzbergen and Davis Strait to

Malta and the Adriatic; Jamaica; North-east America; Japan; Australia; New Zealand: low-water mark to 1180 fathoms.

Fossil. Pliocene and Post-tertiary: Coralline Crag; Scotland; Scandinavia; Belgium; South Italy; Azores.

Very variable in shape and sculpture. Many synonyms; I have noted seventeen.

CONCHIFERA.

ANOMIA EPHIPIUM, *Linné*.

A. ehippium, *L. S. N.* ed. xii. p. 1150: *B. C.* ii. p. 30, pl. i. f. 4; v. p. 165, pl. xx. f. 1, *a-e*.

Hab. Korea, 54 fathoms; young. North Atlantic, from Iceland and Faroe Isles to Egypt; Black Sea; Madeira; N.E. America. Depth 0-1450 fathoms.

Fossil. Pliocene and Post-tertiary: Coralline Crag; Great Britain and Ireland; Scandinavia; Italy.

This polymorphous species has caused the manufacture of between thirty and forty synonyms.

PECTEN SIMILIS, *Laskey*.

P. similis, *Lask. Mem. Wern. Soc.* i. p. 387, pl. viii. f. 8: *B. C.* ii. p. 71; v. p. 168, pl. xxiii. f. 5.

Hab. Korea, 30-54 fathoms. Finmark to the Gulf of Egina; Madeira; Jamaica: 2-722 fathoms.

Fossil. Pliocene and Post-tertiary: Coralline Crag; N.W. Germany; Italy.

The Korean specimens are smaller than those of European seas, although otherwise undistinguishable. They are rather numerous, and consist of single or separate valves. A few of them (upper valves) are coloured and mottled or streaked exactly like European specimens; but they are generally white or colourless. A valve from Rasel Amoush, on the Tunisian coast, has the inside marked with radiating lines which resemble striæ; and I mistook it for a species of *Amussium* or *Pleuronectia*. See *Rep. Brit. Assoc.* 1873, p. 112.

This abundant species has several obsolete synonyms.

CRENELLA DECUSSATA, *Montagu*.

Mytilus decussatus, *Mont. Test. Brit. Suppl.* p. 69.

Crenella decussata, *B. C.* ii. p. 133, pl. iii. f. 4; v. p. 172, pl. xxviii. f. 6.

Hab. Korea, 35-51 fathoms. Spitzbergen; Greenland; Iceland; Scandinavia; North of England and Ireland, and Scotland; North Atlantic ('Valorous' Expedition, a fragment from 1750

fathoms); Mediterranean ('Porcupine' Exped.); N.E. America; N. Pacific (*P. P. Carpenter*): low water to 530 fathoms.

Fossil. Pliocene: Monte Pellegrino, Sicily (*Monterosato*).
Post-tertiary: Fifeshire; Norway.

NUCINELLA OVALIS, *S. V. Wood*.

Pleurodon ovalis, *S. V. Wood in Ann. N. H.* 1840, p. 231, pl. xiii. f. 1.
Nucinella miliaris, *Mon. Crag Moll.* 1861, p. 73, tab. x. f. 4, a-c.

Hab. Korea, 40 fathoms; a single valve.

Fossil. Pliocene: Coralline Crag (*S. V. Wood*); Antwerp Crag (*Vanden Broeck*).

This remarkable little shell is certainly not the *Nucinella miliaris* of Deshayes, who repudiated Mr. Wood's identification of his Crag species with the Paris-basin fossil. But the present discovery in a recent or living state of a generic form supposed to have been long ago extinct is extremely interesting. *Pecchiolia* (or *Verticordia*) *acuticostata* and several other species are common to the Crag formation and the North Pacific. As the Eocene and Pliocene species are not the same, I fear Mr. Wood's remarks with respect to the capability of variation in species which may be descended from more ancient forms are not quite applicable to the present case.

This species is a member of the *Arca* family. I have retained the name "*ovalis*," originally given by Mr. Wood, although it is inappropriate, signifying "belonging to an ovation;" the name ought to have been *ovata*, meaning "egg-shaped."

LEPTON SULCATULUM, *Jeffreys*.

L. sulcatulum, *B. C.* ii. p. 201; v. p. 177, pl. xxxi. f. 4.

Hab. Korea, 35 fathoms; several valves. Guernsey; Jersey; Etretat; Tangier Bay; coast of Tunis and Adventure Bank; Sicily; Canary Isles: laminarian zone to 130 fathoms.

LASÆA RUBRA, *Montagu*.

Cardium rubrum, *Mont. Test. Brit.* p. 83, tab. xxvii. f. 4.

Lasæa rubra, *B. C.* ii. p. 219, pl. v. f. 2; v. p. 179, pl. xxxii. f. 1.

Hab. Korea, 35-40 fathoms; two or three valves and fragments. Greenland (*Mus. Copenhagen*) and Iceland to the Mediterranean and Adriatic; Canary Isles; North and South Pacific; Strait of Magellan; St. Paul and Amsterdam Isles: shore to 20 fathoms.

Fossil. Coralline Crag and South-Italian Tertiaries; Post-tertiary at Portrush and in Norway.

There are a few more or less obsolete synonyms.

KELLIA PUMILA, S. V. Wood.

K. pumila, J. Sowerby, *Min. Conch.* tab. 637. f. 3; S. V. Wood, *Mon. Crag Moll.* p. 124, tab. xii. f. 15, a, b.

Hab. Korea, 36 fathoms; two valves. 'Porcupine' Exped., 1869, off the west of Ireland, 422 fathoms: 1870, between Fal-mouth and Gibraltar, 220-795 fathoms.

Fossil. Pliocene: Coralline Crag, Sutton. The figures in the 'Crag Mollusca' do not quite agree with the description, nor with specimens which Mr. Wood kindly sent me; the figures in 'Mineral Conchology' are excellent. Also Sciacca, Sicily (*Monterosato*).

This ought not to remain in the genus *Kellia*. I should be inclined to place it in Philippi's genus *Scacchia* as typified by *S. elliptica*.

AXINUS FLEXUOSUS, Montagu.

Tellina flexuosa, *Mont. Test. Brit.* p. 72.

Axinus flexuosus, B. C. ii. p. 247, pl. v. f. 6; v. p. 179, pl. xxxiii. f. 1, 1a.

Hab. Korea, 30 fathoms; var. *polygona*, 54 fathoms: young specimens and valves only. Type and varieties: North Atlantic from Spitzbergen and Greenland to the Ægean archipelago and the Canaries; N.E. and N.W. America: 3-450 fathoms. 'Lightning' Exped., 550 fathoms. 'Porcupine' Exped. 1869, 3-630 fathoms; 1870, 5-1095 fathoms.

Fossil. Pliocene and Post-tertiary in Europe (including the Coralline Crag) and N.E. America.

Variable in shape, and therefore having several generic and specific names. The variety *polygona* is *Ptychina buplicata* of Philippi, and *A. obesus* of Verrill, according to G. O. Sars.

PANOPEA PLICATA, Montagu.

Mytilus plicatus, *Mont. Test. Brit. Suppl.* p. 70.

Panopea plicata, B. C. iii. p. 75, pl. iii. f. 2; v. p. 192, pl. li. f. 1.

Hab. Korea, 40 fathoms; a small single valve, but unmistakable. Upper Norway to Sicily and the Canaries, 5-300 fathoms.

Fossil. Pliocene and Post-tertiary: Red and Coralline Crags; Antwerp Crag; Monte Mario; Belfast.

Var. *carinata* = *Mytilus carinatus*, Brocchi, = *Arcinella carinata*, Philippi. Palermo, 32-43 fathoms (*Monterosato*).

Synonyms. *Sphenia cylindrica*, S. V. Wood; *Saxicava fragilis*, *Nyst*; *S. rugosa*, juv., *Forbes & Hanley*; *Myrina oceanica*, *Conti*.

Fossil. Pliocene: Val di Andona (*Brocchi*); Coralline Crag (*S. V. Wood*); Monte Mario (*Conti, Rigacci*); Ficarazzi (*Monte-rosato*)!

An allied species from the Korean dredgings (35 fathoms) is of a rhomboidal shape and more solid; and it has a sharper keel and transverse striæ or riblets. *Arcinella lævis* of Philippi, a Sicilian fossil, is perhaps my *Decipula ovata* from the 'Porcupine' dredgings of 1869, and from Osterfiord in Norway, as well as the *Tellinya ovalis* of Prof. G. O. Sars from the Loffoden Isles. See Friele, 'Bidrag til Vestlandets Molluskfauna,' in Vidensk. Forh. for 1875; and Sars, 'Bidrag til Kundskaben om Norges arktiske fauna,' 1, Mollusca (1878), Suppl. p. 341, t. 33. f. 1, a-c.

SAXICAVA RUGOSA, *Linné*.

Mytilus rugosus, *L. S. N.* ed. xii. p. 1156.

Saxicava rugosa, *B. C.* iii. p. 81, pl. iii. f. 3; v. p. 192, pl. liii. f. 3, 4.

Hab. Korea, 30-54 fathoms; young. Apparently world-wide in its distribution, from low water to 1622 fathoms.

Fossil. Miocene, Pliocene, and Post-tertiary, throughout Europe (including the Coralline Crag), Northern Asia, and N.E. America.

Synonyms, both generic and specific, numerous.

GASTROPODA.

PUNCTURELLA NOACHINA, *Linné*.

Patella noachina, *L. Mant. Plant.* p. 551.

Puncturella noachina, *B. C.* iii. p. 257, pl. vi. f. 2; v. p. 200, pl. lix. f. 1.

Hab. Korea, 30-54 fathoms; var. *princeps*, young. Type and variety: from Greenland and Wellington Channel southwards to Cape Cod, and from Spitzbergen to the Strait of Gibraltar; Sea of Okhotsk and North Japan: 4-250 fathoms. 'Lightning' Exped., 170 and 189 fathoms. 'Porcupine' Exped., 1869, 73-420 fathoms; 1870, 292-1095 fathoms.

Fossil. Miocene (?), Pliocene, and Quaternary or Post-tertiary formations, in Scandinavia, Great Britain, and Sicily; mostly in "glacial" deposits.

As usual in the case of tolerably common species like this, *P. noachina* has received several other names.

Attached to a living specimen of *P. noachina* from 420 fathoms in the first 'Porcupine' Expedition was a *Planorbulina* (one of the Foraminifera) of the same kind that has occurred in the Korean dredgings. Mr. H. B. Brady tells me that this *Planorbulina*

was common also in the 'Challenger' dredgings, but that he had not hitherto found any satisfactory description or figure of it.

TURBO SANGUINEUS, *Linné*.

T. sanguineus, *L. S. N.* ed. xii. p. 1235.

Var. *pallida*. Smaller, yellowish white with a red apex or tip, and having the spiral striæ rather slighter and more numerous.

Hab. Korea, 2-4 fathoms; several specimens. Throughout the Mediterranean, from a few fathoms to 120.

Fossil. Newer Tertiaries of Nice and Southern Italy.

The colour of Mediterranean specimens varies from blood-red to yellowish-brown; but the apex is always red. Such specimens likewise differ in respect of the number and comparative stoutness of the spiral striæ.

The umbilicus is perforated in the young only. It is probable that Linné may have included *Trochus Adansoni*, and especially the variety *turbinoïdes*, in his description of *Turbo sanguineus*, by saying "umbilicus aliis perforatus, aliis nequaquam."

It is the *Turbo purpureus* of Risso and *T. coccineus* of Deshayes.

PTEROPODA.

EMBOLUS ROSTRALIS, *Eydoux & Souleyet*.

Spirialis rostralis, *Eyd. & Soul. Rev. Zool.* 1840, p. 236; *Soul. Voy. Bonite*, ii. p. 216, pl. xiii. f. 1-10.

Hab. Korea. Oceanic and gregarious in all southern latitudes.

Weinkauff mistook this for the *Spirialis Jeffreysi* of Forbes and Hanley, which belongs to a different genus.

Of the above named fourteen species, six (viz. *Anomia ephippium*, *Pecten similis*, *Lepton sulcatulum*, *Axinus flexuosus*, *Panopea plicata*, and *Turbo sanguineus*) are here noticed for the first time as living in the North Pacific as well as in the North Atlantic; *Nucinella ovalis* and *Kellia pumila*, which had been regarded as extinct, the former not only specifically but generically, are now recorded as recent: the other six species (viz. *Terebratula caput-serpentis*, *Crenella decussata*, *Lasæa rubra*, *Saxicava rugosa*, *Puncturella noachina*, and *Embolus rostralis*) were already known to inhabit both oceans. No less than nine out of these fourteen species are Coralline-Crag fossils: they are *Terebratula caput-serpentis*, *Anomia ephippium*, *Pecten similis*, *Nucinella ovalis*, *Lasæa rubra*, *Kellia pumila*, *Axinus flexuosus*, *Panopea plicata*, and *Saxicava rugosa*.